



CYCLE-LOGIC



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Chemistry from PET plastic waste

Polyethylene terephthalate - or PET - is the most commonly produced plastic and it has many properties that makes it an extremely useful material.

The first picture that comes to mind when mentioning PET is a plastic bottle. However, the majority of globally produced PET is used for clothing: **out of the 30.3 million tons of PET produced in 2017, up to 60% was processed to synthetic fibers and only the remaining 30% was used for the production of plastic bottles.**

PET is common for good reasons: it's an extremely versatile material, it's lightweight, safe and easy to recycle. Furthermore, its popularity has grown because of:

- growing scarcity of other raw materials
- lack of arable land
- increasing population
- affordable price



There's a constant increase in the demand for plastic bottles. Every one minute, more than **1 million plastic bottles** are purchased around the globe. In 2016, people around the world bought over 480 billion plastic bottles and the figure is **expected to reach 580 billion** by the end of 2021.

As most of oil-based polymers, PET has poor biodegradability which is a key property for so many applications. However, when not properly recycled and thrown into the environment, PET plastic needs about 1,000 years to degrade. Every year, 5 to 13 million tons of plastic end up in the oceans and PET plastic, having a density of 1.35, sinks and can be hard to recuperate.

Therefore, considering the effort and the energy required to extract it from the earth (**1.9 kg crude oil is necessary to produce 1 kg PET**), we all must take every opportunity we are offered to recycle PET plastics so that we can get more use out of the material.

Bottle-to-bottle recycling is technically, economically and ecologically impressive. Beyond that, **RUDOLF GROUP** has been looking at other ways to make polyester waste a precious resource rather than an environmental threat.

RUDOLF GROUP pioneers a new path: the upcycling of post-consumer, disposable and non-returnable beverage PET plastic bottles into valuable textile chemistry.

Recycled PET bottles, in the form of washed flakes, can now be the raw material for the manufacturing of some of our textile auxiliaries without attacking new, virgin resources.

This tremendous innovation falls under the **CYCLE-LOGIC®** brand, part of RUDOLF **Aspirational Chemistry®** and new horizon for the textile and apparel industries.



In 2021, RUDOLF GROUP launches the first 3 chemical auxiliaries for textiles based on recycled PET:

- **FERAN® UPCYCLE ICT**: the first intelligent moisture management technology for PES textiles based on post-consumer, recycled PET bottles
- **RUCOGEN® UPCYCLE RNB**: most advanced dispersing agent for indigo washing based on post-consumer, recycled PET bottles
- **RUCOLIN® UPCYCLE SDS**: first, all-in-one, multi-functional, high-affinity polymer dyeing auxiliary based on post-consumer, recycled PET bottles

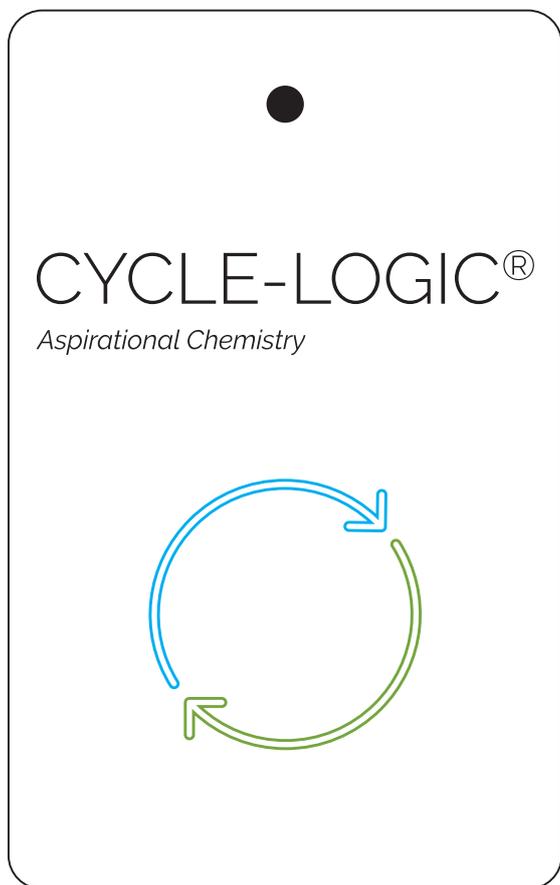
FERAN®
UPCYCLE ICT
moisture management
technology

RUCOGEN®
UPCYCLE RNB
dispersing agent

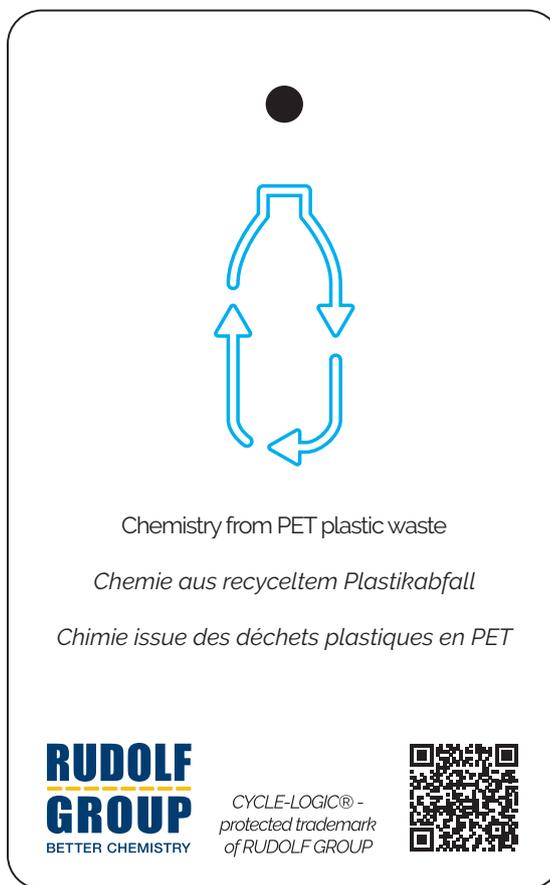
RUCOLIN®
UPCYCLE SDS
dyeing auxiliary



CYCLE-LOGIC® hangtag



Front



Back

It's recycled and it's logic. It's **CYCLE-LOGIC®**



CYCLE-LOGIC®
Aspirational Chemistry